REMARKS

This request is in response to the Examiner's Office Action dated 4/14/2004. Applicants would like to thank the Examiner for permitting and participating in the telephonic interview on August 12, 2004. The following remarks reflect our discussion of claims 2-4, 6-8 and 10-15 which stand under final rejection. Reconsideration of this application is respectfully requested in view of the remarks that follow.

STATUS OF CLAIMS

Claims 2-4, 6-8, and 10-15 are pending.

Claims 2, 3, 6, 7, 10, and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee et al. in view of Gersho et al.

Claims 4, 8, and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee et al. in view of Gersho et al. and further in view of Kang et al.

Claims 13-15 stand rejected under 35 U.S.C. § 103(a) as being as being unpatentable over Lee et al. in view of Gersho et al. and further in view of Das.

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REJECTIONS UNDER 35 U.S.C. § 103

A. Claims 2, 3, 6, 7, 10 and 11 stand rejected under 35 U.S.C. §103 as unpatentable over Lee et al. in view of Gersho et al.

The Examiner asserts that Lee et al. disclose substantially all of the limitations recited in claims 2, 6 and 10 but admits that Lee et al. do not disclose "a rate setting unit setting a voice encoding bit rate, if the voice signal is a vowel said voice encoding bit rate is set to a bit rate lower than the bit rate usually used when the voice part is sounded." The Examiner contends, however, that Gersho et al. suggest variable rate speech coding for phonetic segments including certain vowels in order to reduce the overall bit rate and contends that it would have been obvious to combine the teachings of the two references for the purpose of "reducing the overall bit rate by changing the encoding algorithm for certain vowels."

Applicants agree with the Examiner that Lee et al. do not disclose the rate setting unit as recited in claim 2 or setting the encoding bit rate lower for a vowel than for speech other than a vowel, as recited in claims 2, 6 and 10. As shown in FIG. 4, the disclosure of Lee et al. is limited to determining whether active speech can be classified as voiced or unvoiced sound. Thus, Lee et al. focus on applying a different encoding technique to voiced sound as opposed to unvoiced sound. (See right column of page 1000). Within Lee et al., therefore, all voiced sound of an utterance is encoded at the same bit rate. While Lee et al. mention that certain vowels can be determined based on LSP interval characteristics, this determination is for the purpose of classifying sounds as voiced or unvoiced sound and is unrelated to changing the encoding bit rate for a vowel as compared to the bit rate used for other voiced speech. Accordingly, Lee et al. do not teach nor suggest encoding a vowel portion of a speech signal at a lower bit rate than the bit rate usually used for the speech signal, as recited in the claims.

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Gersho et al. provide an overview paper that generally discusses variable rate speech encoding systems. In one particular passage, Gersho et al. mention that certain *sustained* vowel sounds (emphasis added) exhibit a large amount of interframe correlation of spectrum and pitch that provides an opportunity to save bits during encoding. (See page 174, left column). Thus, this passage of Gersho et al. relates only to certain *sustained* vowel sounds and, moreover, simply theorizes about what might be possible given the characteristics of *sustained* vowel sounds without providing any specific details or implementation. Accordingly, the general statements of Gersho et al. do not disclose nor suggest, a variable-rate encoding system that determines the *existence* of any vowel and specifically reduces an encoding bit rate for that vowel, as positively recited in the claims. Applicants urge, therefore, that Gersho et al. do not disclose nor suggest, with the specificity necessary to support a rejection under 35 U.S.C. §103, the rate setting unit recited in claim 2, that sets a voice encoding bit rate for a vowel of a voice signal to a bit rate lower than that usually used for the voice signal.

Therefore, neither Lee et al. nor Gersho et al. disclose a variable rate encoding system in which a voice encoding bit rate is set such that "if the voice signal is a vowel said voice encoding bit rate is set to a bit rate lower than the bit rate usually used when the voice part is sounded," as recited in claim 2. Thus, even if combined, these two references do not disclose or suggest all the limitations recited in claim 2 and, therefore, do not provide the requisite factual basis to support a rejection under 35 U.S.C. §103. Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103 of claim 2, and its dependent claim 3. In addition, claims 6 and 10 recite a similar limitation of setting a voice encoding bit rate lower than the bit rate usually used, if the voice signal is a vowel. Accordingly, for at least the reasons given above with respect to claim 2, Applicants request reconsideration and withdrawal of the rejection under 35 U.S.C. §103 of claims 6 and 10 and their respective dependent claims 7 and 11.

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Claims which depend from claims 2, 6 and 10 stand rejected under 35 U.S.C. §103 as unpatentable over the combination of Lee et al. and Gersho et al. in combination with additional references purportedly suggesting the specific limitations recited in the dependent claims. The additional references include Kang et al. (U.S. Patent No. 5,448,680) and Das (U.S. Patent No. 6,640,209). As neither of these references remedy the omission of certain claim limitations by Lee et al. and Gersho et al., as discussed above with respect to the independent claims, Applicants respectfully request reconsideration and withdrawal of the rejection of dependent claims 4, 8, 12, and 13-15, for at least the reasons already presented. Additional arguments with respect to the dependent claims are presented below.

B. Claims 4, 8 and 12 stand rejected under 35 U.S.C. §103 as unpatentable over Lee et al. in view of Gersho et al. and further in view of Kang et al.

The Examiner admits that neither Lee et al. nor Gersho et al. disclose using templates to determine whether a speech segment is a vowel. The Examiner contends that Kang et al. teaches filter coefficient templates to represent vowels and concludes it would have been obvious to modify the vocoder of Lee et al. to determine whether a speech segment is a vowel for purposes of reducing the bit rate.

Applicants respectfully disagree with the Examiner's conclusion. Lee et al. is concerned with separating voiced sound segments from unvoiced sound segments. One of ordinary skill in the art would have had no realistic motivation to specifically modify the vocoder of Lee et al. as suggested by the Examiner. The bit rate within the vocoder of Lee et al. is the same for voiced sound whether that voiced sound is a vowel or not. Thus, the use of templates to detect vowels within the vocoder of Lee et al. would not have resulted in "reducing the bit rate" as proposed by the Examiner. Applicants urge therefore, that one of ordinary skill would not have been

realistically motivated to modify the vocoder of Lee et al. to include the vowel templates of Kang et al. because no benefit would have been gained by doing so. Without a cogent explanation of why one of ordinary skill would have been realistically motivated to combine the teachings of the different references to arrive at the specific claimed invention, the burden of establishing a prima facie case of obviousness to support the rejection under 35 U.S.C. §103 of claims 4, 8 and 12, has not been discharged. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 4, 8 and 12.

C. Claims 13-15 stand rejected under 35 U.S.C. §103 as unpatentable over Lee et al. in view of Gersho et al. and further in view of Das.

The Examiner admits that Gersho et al. omit "specific disclosure of setting the encoding bit rate at half the usual bit rate when the voice part is a vowel." The Examiner asserts that Das teaches a multimode speech coder where voiced frames are encoded at half rate or 4 kbps. The Examiner also asserts that "[t]hose skilled in the art would know that a vowel is the most common example of purely voiced speech, and has the most periodicity." The Examiner therefore concludes that Das suggests a bit rate "can be reduced to half rate when the frame is voiced, which is commonly a vowel." (emphasis added).

Applicants urge that the Examiner is improperly using the present disclosure and hindsight to make unsupported assertions about what Das might teach one of ordinary skill. In particular, Das does not mention the term vowel (or any variant thereof) in its entire disclosure. Instead, Das discloses classifying samples according to silence, unvoiced speech, transition speech, and voiced speech (see FIG. 5, steps 406, 410, 414, and 416 respectively). The voiced speech which has certain periodicity is then encoded at half rate as compared with transition

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speech which is defined as "transition from unvoiced speech to voiced speech." (Column 8, lines 30-34).

Claims 13-15 recite that the "voice encoding bit rate is set to be <u>half the bit rate usually used with the voice part is sounded</u> if said voice signal is a vowel." In contrast, in Das, voiced speech may be encoded at two different rates, but this variance is based on the level of periodicity of the voiced speech. Thus, it would be a departure from the actual disclosure of Das to assert that a) Das suggest specifically encoding <u>vowels</u> at a different bit rate and b) that the different bit rate is half <u>the bit rate that usually used</u> with voiced speech.

Applicants, therefore, urge that Das does not disclose nor suggest the specific limitations recited in claims 13-15. Thus, Das in combination with Lee et al. and Gersho et al. do not disclose every limitation recited in claims 13-15 and, therefore, do not provide the factual basis to support a prima facie case of obviousness under 35 U.S.C. §103. Reconsideration and withdrawal of the rejection under 35 U.S.C. §103 of claims 13-15 are respectfully requested.
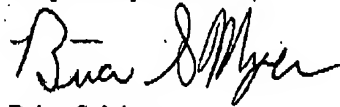
SUMMARY

As has been detailed above, none of the references, cited or applied, provide for the specific claimed details of applicants' presently claimed invention, nor renders them obvious. It is believed that this case is in condition for allowance and reconsideration thereof and early issuance is respectfully requested.

A petition for extension of time has been filed with this amendment.

If it is felt that an additional interview would expedite prosecution of this application, please do not hesitate to contact applicants' representative at the below number.

Respectfully submitted,

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August 24, 2004